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10 People-Centered Approaches to Community Resiliency

>> Lorena Molina Irizarry: Excellent. Well thank you so much for the invitation and having us today. I think the next conversation dovetails very nicely with the introduction and opening remarks. So we're going to talk a little bit about people centered approaches and we heard in our previous conversation a lot around multistakeholder -- multisector stakeholder engagement and how to bring communities and other stakeholders that usually are not at the table and don't have a place at the table to inform and this is not just in how do we better work together across government or sector, academia and the private sector but also what are the voices that we're not hearing that do know what is the best for their own communities and to solve problems in a collaborative way.

So with that, I would love to introduce our panel of speakers. We have David Hartshorn and -- joining us remotely, Dan, I don't know if you're going to be able to see Dan along with us.

But to start with I want to do a quick introductions. I'm the senior advisor for Puerto Rico strategy and implementation under the Department of Commerce as well as Senior Vice President Puerto Rico for the United States census bureau. All things data tech, innovation and communities very much aligned with why we're here today. And I think I want to also talk a little bit about -- we talk a lot about technology, right, enabling communities with technology and bringing them as part of the decision-making process, but data. Data is important and I don't think we talk enough about data when we talk about technology. Without data we can't make informed policy decisions, we can't make informed, you know, cocreation of regulation. And enabling communities with data is equally as important to enable them with technology and access to information in the digital landscape. And we live in a data first economy and digital first economy and this is why private sector I think has figured this out. And perhaps governments and nonprofits and the folks that work in the communities in community based organizations perhaps don't understand and don't have the awareness that without data and access to it, we can't, you know, move forward in terms of collaboration and digital equity. So with that, I want to turn it over to David here to talk a little bit about who you are, what you do and how do you connect with this main theme of people centered approaches to collaboration and participation.

>> David: Thank you, Lorena. Can do.

If we could go et the first slide, Jose, and I'll start by saying that I have been in telecommunications for over 30 years. I spent 20 of those years overseas and I've spent all that time focused primarily in developing countries and disasters. And conflict countries. Community and people have been first and foremost when we talk about a decision-making process, and the need to bring them in, that by necessary is where we're starting our work. And I'll tell you a little bit about some examples of what that work looks like with the communities. It's not primarily for them; it's with them as partners. The organization that I run, I'm the chief executive officer of a global nonprofit called geeks without Frontiers. The organization has a work of people and organizations around the world and we spend most of our time in disaster preparedness and response. We'll talk a little bit about Puerto Rico as a model for that. We also work in conflict contries. We're currently operating in Ukraine and the border countries. And then we work in what are often referred to as marginalized communities, low income, remote, rural challenged in a variety of ways potentially. And what we're doing is putting communications networks in or where there are networks, but they're not being used, we're trying to help drive more active participation by local community in use of the Internet. And associated services. In that discussion -- there we are.

So that's geeks without frontiers. I'm going to be focusing my remarks on people. That's the hard part of what we do. The technology actually comes pretty easily for what we're doing. It's getting the people built up in terms of their capacity, skills, understanding. Do they even recognize the value of the Internet? They don't first and foremost often think of it as Internet. They think of it as, oh, I can have telehealth. Wait. I can have education access for my children? Or teacher content to be delivered into the school where I'm operating in this remote village in southern Africa? Or whatever. It's the application often that is first and foremost in the mind of the community.

So with that, this is an example, the photograph on my right, your left, that's a community of Syrian refugees and you might say okay that's refugees, that's different, but it's not. They have been there hundreds of thousands of them living there with a barbed wire fence keeping them there for more than a decade. Children have been born there and no no reality other than growing up in a refugee camp. The UN will tell you the average time spent in a refugee camp anywhere in the world is 17 years on average. And what you see, if you go below the surface of this photograph, this is Zadari in Jordan. It's hundreds of thousands of searian refugees. And if you look below the surface here what you have is a mature refugee camp, which this goes to the point of resilience, where these people came to this place with nothing but the clothes on their backs in most cases and today you walk down, there's a main street tru the refugee camp. There's a shop that sells nothing but wedding dresses. There's banks. There's schools. Health clinics. That has happened because of the refugees. They don't want to be called refugees. They're people. So a people centered strategy to address the needs of them will bring true resilience and it has done. It's still not where it wants to be, but this -- if this was a city in the country of Jordan, it would be the fourth largest city in the country. There are places like this all over the world, in every major region of the world. And what happens inside there is of critical importance to us to get it right. Sorry, that's sounding a bit like a speech.

If we could go to the -- oh, next -- this one on my left, your right.

I was smiling to myself in the previous session because everybody was going on and on about multistakeholder and I totally get it. We work with multistakeholder organizations constantly. And we like them so much that we created one (chuckles) and we just did it a year ago. I'm not sure you would consider this a true multistakeholder organization but it is in my mind.

Could we go back one slide to that big pile of logos? Right here. So a year ago we were enlisted to launch a program, multi -- academia, private sector, nongovernment, anybody would be welcome free to join. By the way, American University is welcome to join.

George town is on board and Arizona state university. So academia has begun to be well represented here. But the point is, we need this type of collaboration, multistakeholder, to drive success in project implementations in these communities with these communities.

If we could go to the next slide.

On my right, your left. These are a few examples of projects that are underway right now through that program, through that collaboration of partners there, 's about 150ish around the world. We have about 50 projects in the pipeline, this is implementations into communities with them.

One of them, for example, Zambia Africa, this is edge or as we think of it deep edge, it's way out there. They have access, they're not using it.

So what we've done is worked with the local providers of that access to get zero cost movement of data across the network so that people can actually use it. What do you need it for? We asked. Education. That was first words out of the community's mouth. Okay. So we started to cache locally large amounts of education network developed locally by local NGO and provide it for free into the school system. And so that will begin to run. They were like thank you this is great. Can we have health services too? So then we went and found local content provider for telehealth, layered that over the network preexisting network and now they're using that. Then they were like this is fantastic. We want religious content. Can you get us access to that? We're like maybe. So we go out, we find channels not to one but multitude of local faiths that they have there in Zambia and we've layered that into the same network and now they've come back and said we want animal husbandry best practices. So that's why I said at the beginning of my remarks the importance of applications in creating a sense of relevance by people in a community and that's going to drive sustainability and that drives resilience. I'm not going to have time but Ukraine and Indian country, the work that's under way there is massively about public and private sector collaboration, working with local community, and maybe we'll get into that later in the discussion. I don't want to dominate. Can I have 30 seconds more?

This one on my left is in Puerto Rico. This is a project that hasn't been implemented yet. But we've done the groundwork and we have multiple community groups there who are fed up with government, who doesn't show up whenever Irma comes and wipes out their homes or Maria or Fiona. So they've taken matters into -- they're trying to take matters into their own hands and create resilience at the community layer and they need partners. And we'll talk more about that and what it looks like in just a moment.

Lorena.

>> Thank you so much, David.

I think keeping this thread on-going around community resilience and being data driven with communities at the center, can you speak a little bit, Richard, a little bit about your background, context, and how do you connect to this work?

>> Richard: You bet. So, yeah, as they say at Monty python now for something completely different.

My background's a little unusual and Jose if you want to bring up my -- I have way too many slides because I'm an audiovisual kind of guy. So I'm going to -- maybe we'll start on my street creds slide and I'll tell you my background and then Jose you can just flip through them at will after that and I'll speak to some of the things that you'll see visually on screen.

So the first one there you'll see that comes up, I'm one of these meta verse guys you hear about. I have been trying to make the meta verse for 30 years. When I speak at colleges and at high schools, I always tell the kids that, you know, my first start-up was before there was a graphical Internet. So I wrote a book in 1995 about the 3D Internet and how it's going to be -- it's imminent, going to be here any day. It was a best seller. My Twitter handle is meta versal, so I'm still trying to make that happen but I started in gaming. All the '90s were my -- this Peter Pan existence of building computer dpaim companies with like Tom Clancy. So where are my red storm rainbow six guys? Anybody? No gamers? Are there no gamers in this whole environment? There have to be, you just don't want to admit it.

>> I'm a gamer.

>> Okay, thank you.

So we did game companies with Michael citingon, Ozzie Osborne, science writer Michael Adams. Only one of those people still alive, you can draw your own conclusions, then worked in the film industry but the point of all this is this medium of making a virtual world and living within it and pulling all that data into it is something that just comes natural to us and my team and we have been trying to make that happen on the Internet for a very long time. Now, why do we do that? How does this map to resiliency for communities, that sort of thing? If you go to the next one, Jose, that has the street cred slide on it. My whole 30 year career on one slide. If you can get there.

There you go.

There's that book I wrote that was translated into six different languages and that's how I met my wife. She was sitting in Venice Italy and read the Italian version of it.

So then you'll see a little period in there where after September 11th, I got serious with this technology started applying it to learning and that kind of thing, Lockheed Martin right down the street here bought my company and I spent seven years there run a group called virtual world labs. And that was with VR, AR spatial computing we call it now I heard. And AI and machine learning, we had over 100 patent disclosures there. What I was doing at Lockheed was trying to improve human performance, but also doing something else that I think applies here, we were modeling entire countries. So we would model Haiti, Afghanistan and the idea there was if you're going to go into Afghanistan and you decide as USAID you want to build a school for girls, it's helpful not to just have the geography and the buildings and that kind of thing. You also need what they called and forgive the phrase, the human terrain, right? And that is let's look at all of the different values, traditions, ways of thinking, and living there are in Afghanistan. If you go build a school for girls in Helmand province who's going to be okay with it or be happy about it? Who's going to be neutral or who's going to be so angry they're going to shoot Malala, try to burn down the school that kind of thing. It's that human behavior element of it I think that's really compelling.

And again, Jose, you can flip through these slides as much as you want but going back, I know you and I share a fondness for maps and globes and that kind of thing. I was actually building 3D models on the Internet of cities before -- like in 1999. I was in -- I'm see a slide when I was in Newsweek where on the Internet the Russians had released this spy -- Lamida spy information about Groom Lake. Anybody know what Groom Lake is? Area 51, right? So the FBI showed up and said how did you get this information? I'm like there's this thing called the Internet. Data's starting to populate out there whether you like it or not. I was able to grab those satellite messages and by looking at, you know, the shadows and knowing what time of day those pictures were taken was able to model the heights of the buildings. It made a fair -- an accurate enough model that it upset the FBI. So I was in Newsweek for that back then.

But now this idea of making digital twins of the community and thinking about like infrastructure and people and that kind of thing, if we go through some of these slides eventually you'll start seeing how we're going from like this 3D model of a city, of geographies and now starting to think about infrastructure and you'll see some of those models popping up, this was shock wave 3D back in, you know, '99 that you're looking at there with Charleston and Knock and Venice Italy and a couple of other places that we modeled, that was all on a Webpage by the way, way back then. But now we're able to do a

lot more detailed, now we're pulling in all the Internet of things information and that's one of the issues you'll see here is with University of Arizona is they wanted to be able to see all the devices that are connected to the net. It turns out it's an order of magnitude or several orders of magnitude more than the people that are connected to the net and that's another issue that we all have to deal with is there's sensors, all kinds of things connecting and they represent vulnerabilities for cyber security, all sorts of things. So modeling all of that, seeing it and being able to manage it is important. Now eventually through the slide deck you'll also see and this is what I wanted to get to is, you know, when the pandemic started, we took a lot of this experience of modeling terrain, modeling geographies, and then starting to model people. So we realized especially with the machine learning capability we had that the data exhaust, all of us give off every day create these patterns of life and because we're gaming people we just said those patterns of life, man, they're like game characters. They're nonplayer characters and games. So I can make models of people but from real data, put them in these simulated worlds and then test out like what happens if we go do this or that. And I think with Puerto Rico and some of the things you'll see at the end of this slide deck that I have been talking about with the people centered Internet is this idea of we keep trying to do things, we mean well as government, right? So we come in with like investments and policies. But what if you could model and simulate and predict this first, second, third, fourth order consequences of those actions before you do it. Build back better sounds like a great idea. How's it going to affect every one of these communities? Is it going to affect them all the same way? Probably not. During the pandemic, and we were I think somewhere there you'll see a slide where we were a final list for the X prize, one of my companies for the pandemic response challenge. And what we did differently is most people were just doing predictions of infection rates by looking at very simple SEIR models. What we said is like that's only part of the puzzle, right? The other part is who lives in the 3,000 counties in the United States? What are their values and traditions and ways of thinking? Who are their influencers? How are they likely to behave if you come in there with a government mandate? Or if you try to get this influencer or that influencer to say something to them, like you should eat kale, stop smoking, wear a mask, socially distance, right? So using those models and people from like this guy, economist at the university of California in San Diego, we took his algorithmic models of people's behavior put them in these simulations so we could tell you county by county how people will likely react and if you want to get different behavior, who do you need to get to say what? And in what order to move them to better behavior where they're moving around less and taking more precautionary measures.

What you're seeing now that's the last slide there but that's one of the examples. One of the early ones which I hope we'll be able to share with all of you, in both the State of

Washington and North Carolina we took some cares Act money, did this modeling, created this dashboard for government there so the governor could say I think this is really important for policymakers like you Lorena and people in government who are called out on the podium to say like why didn't you do the right thing in Puerto Rico? Why has it taken so long to get relief efforts here? And what I want to do is provide these kinds of tools that I have up here, the simulation capability so that you can say look, don't yell at me. Let's look instead at the data we were using. There's 188 different data sources that are coming in. They're being processed in a certain way and providing us with guidance. So on the day we made the decisions we did, these were the -- this is the data sources. These are the models and you can question those all you want. We might have gotten it wrong, right? Just like when we see hurricane predictions there's 15 different courses, right? But what if we could look at that and argue with that as opposed to like yelling at people like Loraine over here which I couldn't imagine anybody yelling at you, but -- and the last thing I'll say is the core thesis of what my teams are doing is that this is the simulation century. So the last century was about the moving imagine. It's the first time in human history when we can look at these major events, past, recent, or even future history and review -- or not future yet but review video footage of it, right? And Marsha Mcclanahan would say that medium changed us societily, it changed us psychologically, and had cultural, you know, impact on us. This is a simulation century. It's the first time where we can actually model and simulate past, current events and then make better decisions. Now we have AI and this really new powerful generative AI machine learning capability that can help us make better informed decisions. And most people think about this just as prediction. Like I can just predict better. But modeling and simulation is a lot more than that. It actually lets you affect and invent the future. And so if we have a good idea of like what we want Puerto Rico to be, you can model that, simulate it, and then cause it to actually happen with all the right connectivity and all the energy and the other stuff that's in my deck there.

But I look forward to the conversation and I'll stop now.

>> Thank you so much for sharing. No, this is very exciting because I think most people don't necessarily make the connections of, you know, one, the gaming industry or simulation to helping communities and helping them solve their problems with them and not for them. I think back to the concept of built with, not for. So I want to introduce Dan York, director of Internet technology of the Internet society. So I think we can --

>>Dan: Hello. Hi, everybody. I'm glad to see all you have down there in Washington, D.C. Wish I could have joined you but that didn't work out today. So it was interesting to hear Richard talked about VRML. I have been online since the mid 1980s and so at one point

was also experimenting with that to a certain degree to see what we could do to create virtual worlds back then.

I'm with the Internet society which Wolfgang talked about earlier as ISOC. Also known within Internet governance circles. Been around since 1992 and really focused on building a bigger, better Internet for everyone in some ways and promoting and defending this Internet of ours in so many ways. I want to take it in a different direction too and talk a little bit about really what we talk about in the industry as community networks. You know, we have a fundamental vision, the Internet is for everyone. And I think COVID certainly showed us a need for it and it also showed a typical models aren't working. So we talk a lot about what are called community networks and when we talk about the theme of this, community resiliency and about what you just said, Lorena, building it with people or being part of that, we focus a lot of our energy around how do you connect that third of the world that isn't connected or in some areas are underserved and how do you build communities that are by, for, and of the communities in which they're part of that. We do a lot of this work. There's a lot of different models for how this -- these community networks happen. Sometimes they're called complementary access solutions. Sometimes called community networks. Sometimes they're cooperatives. Sometimes they're government entities. Sometimes they're, you know, municipally operated. There's a wide range. They all -- they can be from very few people to very many. They can use different kinds of technologies. They can be fiber. They can be wireless. They can be mesh networks. They often have very different purposes. What we found over the years of working with this is that they all need we could say five different elements of what makes these network in some ways. There needs to be a favorable policy framework in thinking in terms of the school for Internet governance here. One of the things is that we need to make sure that these -- the regulatory framework supports the ability of communities to create networks and be part of the solutions here. You would have what we call in technology industry more is back hall, connectivity back to the rest of the Internet. How do you connect there? Whether that's fiber, point to point wireless or mic waves, satellites, whatever. You need to have some kind of connectivity there. I was struck by what David mentioned there too. You also have to support this with helping people understand why they're going to use this. It's not enough to bring somebody a connection and a computer terminal, you know, right, what do they do with it, what can they work with it? How to you help people understand what those technologies are and what they can be used for. And you really have to start out with what is the community that's out there? What's going on? And how do you make it sustainable? Financially in the long run in some way. These are sort of the fundamental principles of what we've seen. I'll point you to our Web site. We have a whole range of range of different stories, I thought I'd highlight a couple that are

interesting. Network in glim bobua, the Murambinda network, really started out supporting a small little calf Fay and some pieces that started there. Emerged over time to go and be a much larger project which is going and connecting schools and the local hospital and much more around there, all of that around there. Most recently we have been working with bringing a community network to a very remote region up at the top of Mount he have been rest and the sherpa communities there where we have been able to bring up connectivity to help them provide education, you know, healthcare, telehealth as David mentioned earlier. Those things all that are critical for people to be able to work with it. Coming kind of back to North America we have been doing a lot of work with Indigenous communities around the region, around looking at how they can become connected there, some of the least connected parts of North America. Is there's an event called the dn indigenous connectivity summit. Just wrapped up for 2023 but you'll find some information out there about it. A lot of great information in presentations and info there where we have been able to create a good number of networks around the world in different ways. The nation of Hawaii is an interesting one. They've gone and developed a whole series of community networks connecting large parts of their population in parts of Hawaii that were not served before. New York City mesh, if you want to really interesting case study and we have Joly I know is running our video and he can talk about that directly but it's a fantastic program that's really creating connectivity throughout many parts of New York City.

You know, not necessarily something you think about when you think about under served but there is regions and areas where it cannot affordable in some case. NY mash is doing some phenomenal work wiring up one of the largest cities in North America. Also an interesting project happening up in Winnipeg, Canada, which is wiring up the north end of Winnipeg which is a very different aspect, socioand economically than the rest of the area and it's providing that connectivity. We also partnered with the true foundation this past couple years and we've provided a range of grants across the southern kind of northeast, southeast United States scenarios to go and help that. I would mention all of these are being built, operated by local communities. One I wanted to point out was a project in Tuskage, Alabama called the justice cyber wagon there's some historic reason that out there but one of the things I love about this case study was that they focused a lot on that digital skills, you know, what do you do beyond the, you know, once you put the wire or fiber in this case, you put the connections in there, what do you do with it? And they've created some interesting aspects with an after school training program, technical training facility, some pieces and they've really focused on building entrepreneurship in the local community that they now have access to this global Internet. Back Lorena to your point,

we need to be thinking about the people and what do they do with this Internet connectivity once they have it in some way. That's really the critical part.

I'll just wrap up and say that the Internet society has a funding program where we are -- where we do provide funding for people. Unfortunately I must say it's closed at this point for the 2023 because we've used all the money that we had. Although if there's any organizations looking -- wanting to get into this or corporate social responsibility goals we would love to talk to you because we have a mechanism to get that funding out there to connect communities and we would be able to talk a bit more about that. I would say to speak stay tuned for 2024 where we'll be able to provide a bit more of this and just one other comment too, we're watching the whole space around low earth or by the satellites, or LEO satellites. And there's some fascinating work happening there. The big name of course is star link from space X but another entity called one Web which should have global activity by the end of the year. Amazon is launching his project Kuyper, enterty in Canada called teleSap looking to do this. Over the next three to five years conceivably we could have an additional 40 to 50,000 satellites being launched and we could have a whole other discussion around all the challenges around that or different opportunities, but from a community network aspect, this represents a fascinating potential to bring connectivity to places where we haven't had it before. We've had traditional satellite connectivity which has been a good option but now these newer systems are giving high speed low latency access so that you can be able to participate in the online gaming and virtual worlds that Richard is talking about or just education in spaces or in Zoom calls like this in ways that you couldn't before. So we wrote a document about it. It's up on our Internet site but there's a lot more in the space I think to look at providing connectivity to communities and to providing resiliency for communities in terms of various different options for connectivity.

We can talk more but I'll leave this in the slides. There's a lot of things for policymakers and people involved in Internet governance to be thinking about. One is making sure to include the communities from the beginning. Sometimes we see a lot of these proposals that go out and they think about, you know, they're going to do all this and then present it to the community. But they really have to work the opposite way and think about how do you bring the community in first and involve the community and what is -- what problems are you trying to solve, what is the best solution to go and do that. Encouraging cometion for access. One of the chat lengths we're seeing in the United States right now is there's an enormous amount of money being poured into broadband and Internet access as part of the ARPA act which is awesome and has a tremendous capability to go and help bridge digital divide here in North America and particularly United States but there's a lot of

competition in some of the telecom companies and Internet service providers are looking how they can slice a lot of that for themselves but we need to make sure we're providing options for community networks, for others to be part of that, you know, in making sure it doesn't just all go to the existing incumbent Telecom companies in some way. One of those mechanisms sincerely to make sure we ensure effective and accurate mapping. I don't know how many people are aware of the way the funding is going to be allocated in certain areas but it has a lot to do with what the maps show from the FCC et cetera as to what level of underserved or unserved or underserved. A lot of discussions happening around that. We're also strong advocates of making sure that we look at the outcomes, not necessarily the methods. We want more connectivity. Whether it happens through fiber or satellite or fixed point wireless, those are details but we want to be careful when policies are being created that they're not being created for instance to mandate that it has to be fiber to the home or something like that, which may only be fulfillable by the local incumbent Telecom company or something like that and brings in not only the existing service providers for tremendous capabilities but also leaves room for other service providers. Ensuring communities can maintain funding and also requiring accountability this is a big one. Some processes in the past that have said contract was to bring fiber or other connections through a neighborhood. It didn't necessarily say you had to connect the homes. You wound up with people getting fund. They run around with cable but not bring it necessarily to them. We want to make sure we're looking how do we connect people, bring communities I don't know line and the point we mentioned already, go the to include the digital skills and training to make sure people can use this and sustain it for the long haul. Can't just go drop in connectivity and do that. These are all points that we're thinking about, working about. I will also say I've great fascination and interest with the disaster response elements of all this. Looking forward to more of our discussion and I will end that there.

>> Thank you so much Dan, I think this provides.

[APPLAUSE]

>> Yes, let's applause to the presenters.

I think I want to bring it back to something that is very foundation but very key in the government, Federal Government has been thinking about this problem for a while now and it's the intersection of innovation and facilitation. And it's who are the trusted messengers? What is a message but who are the trusted messengers in convening, in facilitating we talk about multisector stakeholder, we talked about mesh networks and, you know, community networks. Bringing people together it is very challenging and the

facilitation is equally as important and who facilitates it's equally important as a the work being done and outcomes we want to get and I think the outcomes based approach we definitely should talk about that a little bit more as well.

You know, you mentioned corporate social responsibility as an incentive, ESG goals now every institution, every financial institution, you know, when we are thinking about deploying funds to communities that are marginalized or underrepresented, there is an entire infrastructure that we assume needs to be in place before we are able to deploy resources initiatives and get the community engaged. So this notion of facilitating how do we bring all these multisector stakeholders to the table it's not only a challenge but I think also a language issue here. It's a taxonomy. How we're talking about these problems and defining the problems in the first place. Just by way of example, back in the Obama administration we're looking at how do we address this but put data and information in the hands of people and technologists to solve the problems for good with the government and communities and academics and the policy experts. And there is a program that actually came out of that run out of the census bureau called the opportunity project and I'm just mentions by way of example where it's, you know, government serving as a convener stakeholder, federal agencies working with communities to coidentify what we call problem statements and earlier in the welcome remarks, the presenter spoke about identifying the issue and then coming up with the solutions instead of the other way around which is let's figure out a solution and then say hey how many problems does this solve.

And I think the anchoring of federal, local government, third sector, academia, communities what is a problem that we all want to solve first? And how do we define that problem together with the same tact onmy, the same language, coherence of are we all and understand in the same kind of level of understanding of what problem are we trying to solve first and then let's think about the data and information that's out there, then let's do the user research, let's talk to the communities, let's be human centered. Let's talk to the people that this solution is going to be designed for. And they have to be at the table. I think that realization we call in this initiative the opportunity project I hope you can check it out, census.opportunity.gov -- [opportunity.census](https://opportunity.census.gov).

Sorry.

We have created this new model that it's not new and you can white label it with, you know, any name that you want but it's really, let's be human centered, people centered and get them to the table, however as we all know, government is sometimes not the best convener or the best messenger and how do we kind of turn this around.

Can you speak a little bit more about how to facilitate these type of interactions because the notion and concept, community works it all resonates to everybody in the room but it's really kind of the rubber meets the road moment of who facilitates and who takes that message for -- who invites the community to participate versus who invites the policymaker, who invites the regulator. Can you speak a little bit on that in the context of your work.

>> Richard: I can sort of continue on the with the thread that I was pulling on there about simulation but when I was listening to you talk right then I was thinking about that issue of trust, which is a big issue that's come up a lot. I mean, during the pandemic we saw that. Just because, you know, an official says this is the right thing to do, you have a trust issue if that community is not bought into that. And then the other part of it is just complexity theory. Things are only going in one direction in terms of complexity as far as I can tell and that's why I think the only way to do it is to really get our arms around it completely. I mean, we humans are making, you know, systems so complex we don't fully understand how they work, our financial systems for example, the healthcare system is an example and therefore we can't really have any hope of managing it until we really get some help. One of the things we say is a standalone human being is insufficient today. I think being augmented in some way with AI and some of these other tools but if you model and simulate the entire problem set and that's the -- in my old lock he'd day it would be diamond -- it's not just the geography but all of the political and infrastructure and all the different effects that might come from an action you might take and then think about modeling those people too. Where are they right now? What are they thinking and feeling? And you have to include them in your model.

>> And then part of that is like you said on the trust side is who will they trust? So is it their local pastor? Is it a celebrity? Is it a government official? Is it a political leader? Whoever that is, you want to enlist their I had a. And if you leave them out and just say the CDC says to do it because they're the experts, that is unfortunately insufficient today. Like so we need to have these deeper models with more understanding and then include these models of all the people's -- you know, what people actually think and feel in that and tune our policies and our investments to the communities where we're trying to serve.

>> I could just add to that and I'll pick -- that's a very good intervention, and I agree with everything that was just shared.

On the question of trust and who will they trust, I think it is equally important to ask who should they trust. There is a lot of trust that is given by local communities who are disadvantaged to those who are not worthy of the trust. And it is violated again and again

and again. And I could -- hey, Dan, there's -- I was tracking with a lot of what you were saying in your presentation. I was actually at the Indigenous connectivity summit last week in Alaska and there's -- you feed a trusted partner who is dispassionate, who does not have a bias. Dan, you talked about the importance of technology neutral trait. I applaud that being included in your remarks. And let's look at a specific case and see what this looks like in Alaska they are -- the Indigenous communities there are beneficiaries, they are eligible for extraordinary historically high amounts of pandemic relief money, okay? How can they leverage that money in a way that will get them to scale, it will be sustainable, it will be impact, everything you want out of an opportunity like that but it's Alaska. There's 700,000 people scattered across a very, very large land mass. It's about the -- almost half the size of the lower 48 states with only 700,000 people scattered all over the place. In many locations, no road. The only way to get to these people is by plane or boat. Okay and the federal policy on how those pandemic relief funds are supposed to be spent is biased massively toward fiber. We love fiber. Our organization is tech neutral and we -- you know, if you're doing thick route point to point delivery of broadband, give me some fiber. There is nothing that can beat it. But when you have thin route point to multi point widely dispersed population, fiber will not stand up financially over time. It doesn't add up.

So okay, trust. Who's going to provide these services? Is it the communities? Well, the foresight that was given by the Federal Government in this case was positive. It was really good and actually a credit should be given to the current administration inasmuch as they brought Indigenous leadership into the planning group on how this money would be allocated out to Indigenous communities. However, there are these deficiencies in the policy that are there and how do you work around that? Now that's one. Government. The other is private sector. They have something to sell. I used to be in the private sector. I used to sell. Okay. So there are products that are being sold. They are square pegs and they are being sold for round holes and vice versa. It's just the way it is with the private sector. So you need someone in the middle who gets it on policy and who gets it on which technology is going to make the most sense for a given application, community location, geography, demography, all of that. Mapping comes into play. So you need someone who is worthy, who is worthy of the trust and who does not have an axe to grind working with these communities.

And for that final note, because of the work we're doing massively with indigenous communities, you know, we're not eligible to receiving any of the money directly from the Federal Government to help those communities. So what we've done is help them raise the funds themselves and then when the money arrives help them to leverage it in a way that will be sustainable. To do that, you know, we're a bunch of nonindigenous guys and

gals. So we created an advisory board of only indigenous leaders to tell us, you know, point and shoot where do we need to go, how do we need to go so we can have that critical piece of trust.

>> Dan, please go ahead.

>> That's awesome David both that you were up at ICS in ridge and also the work that you're doing there because that goes back to there's this principle of first mile first of getting out there to the people and involving the people who are actually going to be part of that.

I would only add and second Richard's comments that the complexity is just growing. And I think the challenge that we collectively have is that the complexity and the number of players in the space, you know, you heard earlier from the first panel, the responding of Wolfgang and Derrick, they're talking about the geo political aspect of this and the added complexity of all of this. It makes it challenging for a policy environment in which policymakers can even understand what's going on and this is one of the challenges we have when we talk about how do we build community, community resilience, who are the policymakers trusting? Who are they talking to to understand what they should be recommending? What they should be doing? How do we go and create that.

To Dave's point, fiber's the goal, right? If you can get it, that's the, gives you the lowest latency, all around that but we also have to accept that in many places it's not necessarily going to get there. It won't be able to be there as quickly as you can. So it's violate that we continue to have that option. The end goal is we want to connect that third of the world that's still not fully connected. That's what we got to keep our eyes on.

>> Thank you so much, Dan. I actually want to -- you reminded me of a comment earlier around being bottom up, open, and participatory. And I challenge that. Let's think lateral. Let's think diagonal. Let's think how do we get all the different inputs from all these different stakeholders to kind of neutralize the language. If I say HCD, what does that mean to you? You can just quickly speak up. HCD.

>> (Away from microphone).

>> Thank you.

>> Human centered design. When we are thinking people centered first, in the design community and this is something that big tech has mastered, is how to be human centered? How do you keep people scrolling in your feed whether it's Facebook or Twitter? How do you keep people coming back to checking every single notification and app in your

device? Big tech companies have understood that human centered design is not only the approach; it's the first approach to how to design around in solving for problems. However, that language is not necessarily used in other sectors when we are thinking people centered. We are thinking about human centered but also around environment and going back to scale and sustainability. We were talking earlier before the panel started around climate change and, wild fires it with the experienced not -- and the entire eastern coast and we see it of course on the west coast, around the world. I think we were down from like 120, I don't know exactly what the measurement is, so Thursday was fine. New Delhi is upwards of 300 every single day. How do we connect globally with this perspective of being human centered to think about innovation designing solutions in a facilitator process that benefits everyone but really when we think about community resiliency, it's about the people. And making the people feel like they have the tools and are empowered to scale. And I think I want to go there next. It's about scale. And I think without a common language across the different sectors, we're not going to achieve scale because everybody lives in their own perhaps silo universe with their own taxonomy and language around this. Just recently this past November the Federal Government put out what's called the LTRR because we love acronyms. Is the equitable long-term recovery and resilience framework. There's a federal plan that was put out. It actually stemmed from a broader initiative that was in the NDO space called thriving U.S. If you want to check it out, I encourage you. Thriesks.U.S. Based on SDG goals and talking about ESG, how many people know ESG as an acronym actually? What does it stand for?

>> (Away from microphone).

>> Environmental social governance. So this is the framework that the framework that the world is moving to. CS was corporate social responsibility, let's do things for good, let's collaborate. Now we're kind of -- I think that that biggest iteration of that ES G and how are we going to ashrine to ESG as kind of -- globally. This is not just U.S. of course but at a global scale. So when we think about equitable long-term recovery and resiliency, do we have the same language? Do we have the same, you know, conversation happening? And we do, but it's a different kind of universe if you go to different stakeholders. Like government industry third sector and academia. And we're all talking about the same issue but with a different language. When we think about scale and when we think about how do we neutralize this gap in language and understanding, are we talking about the same things? Are we trying to solve those same problems and who is coming up with the problems that we want to solve for? And is that being crowdsourced from the same community or is it being crowdsourced from the regulator on the policymaking -- policymaker? So just, you know, with this thought around being equitable when we think

about long-term sustainability and scaling of what works, I think there is an approach also of iterating and demoing and prototyping that, you know, in the innovation and I was one of the cofounders of the census open innovation lab where we were completely turning around how do we do collaboration with government and third sector and industry in a better way so that government can actually be ahead of the game or at least in a neutral place when we think about, you know, cross sector regulation, for example, or policymaking. If we don't understand what the technologies mean, what they are, how are they built? AI, we're talking about, you know, Web three and block chain and crypto and digital financial assets.

All in the same conversation we're never going to be able to kind of reach that level of scale.

So thoughts on that?

>> Richard: Yeah, I mean, that was a lot. So I was trying to take notes in my head and I'm not very good at it without having my tools in front of me. So but I think, you know, the -- like the -- going back to complexity theory and all of that, but I think if you're going to scale this up -- actually why don't you start while I collect the rest of my thoughts on this.

I'm going back through my notes.

>> So the way we see scale. I've lot of partners. Dozens and dozens of partners that are steelly identity capitalist for profit operations and we deal with them all the time. And we need them badly which is why they're our partners, but public sector, need them just as badly for different reasons. And then out at the community end of this, I'm getting to scale, most of the communities that we're engaged with are really small. They're scattered. They're in jungles, they're in desserts, refugee camps. They're in -- you know, in disasters and they're disbursed and that's a hard business case to scale. So for years what we have increasingly been turning to is to gather in multiple small communities into one group and then we call it a market. And that excites the private sector. And the U.S. Government to their credit, again, back to this recent round of pandemic relief money, they wrote into the notice of funding opportunity, the NOFO, a preference for these remote communities who are applying for the funds to do so as a part of a coalition or as a cooperative or whatever you want to call it. And there was I think great vision in that. And what does it mean practically? What it means is that where you have a tiny community -- and I'll give you a concrete example. We worked with a group of tribes in the eastern Sierra, high dessert, Paiut and show showunny nations that were broken up and scattered across multiple reservations all up and down that valley, eastern Sierra. Poor to a large extent and each

reservation in itself was small but there was a cohesion for the possibility of cohesion between the reservations as A they were already part of the same tribe, B, they had the same opportunity to leverage funding at a level they had never seen before. So we worked with them to create a coalition of Paiut Shoshoneny reservations. And then we took that out to the private sector and the Federal Government both at the same time through grant applications that were written saying look, these tribes have formed a coalition at your recommendation and they're ready to begin leveraging funds. They have now been notified they are going to receive those funds. Exciting. However, mole whole process was delayed. Government money is hard. So what do you do in the meantime? There's problems. Real practical problems for these tribes because they said yeah to their tribal council, there's this great funtding, we're going to apply and leverage it. And then there's a one year delay where you hear crickets chirping. It's bad. Private sector, we bring the private sector in and we show them, hey, there's a market here. It's not one tiny reservation with 400 families. This is an entire valley in the western United States. There is the opportunity for, finally I'm saying it, scale. And they jump all over it. They have built-in know labs. They are rolling out devices into the entire community. Let me just say as a sidebar in the beginning of the last session, somebody -- one of the speakers referenced, you know, the types of applications and use of digital services. One of the first things we saw was everybody got a laptop and the tribal government put their regular tribal council meetings online and allowed remote participation. It's a pandemic. They allowed all the members of the tribe to participate in all of the tribal council meetings. This is the first time it had ever happened and it was for members of tribe who were on the reservation but also anywhere in the world. They had record attendance and it drove new direction for tribal policy. It transformed the tribe just because they suddenly had laptops. And access.

So any way, that's scale. And that's the output and outcome of scale and that excites government and private sector and academia as well.

>> Dan: I think as well if you go back to the what you talked about the beginning ask climate change and sustainability. One of the powerful parts of the -- of building community networks or the networks that you talked about there is when you enable -- if they're truly of the community then you have the community buy-in and community involvement in not only creating the network but running the network. So when there's a problem with Wifi, it's not that they're calling some call center for some IS. P located somewhere else in the world; they're talking to somebody else in their community. They're talking to the people that are there and so the best instances of these kind of community networks are ones that go and leave behind that building. They build that local resilience and that local capacity in a technical level to be able to do that. So when you're talking

about climate change or, you know, issues around that, as climate affects different kind of connectivity or electrical connectivity you have the local resilience and ability to problem solve right there where the network is. I think that's really, you know, the key driver.

And Glen knight actually threw something in the chat. We have to remember power is part of this as well because the Internet, all of these systems, we need power. We need elect. So, you know, if you have a smoke wildfire coming through, it actually turns out it may not affect -- I was very ceerous about would it affect some of the Leo star link kind of connections and it didn't. Those systems seemed to work well through the wildfire smoke but in one case somebody said but I wasn't getting enough sun to my solar panels to charge the batteries I needed to work things. So you've got to to remember both those, that Internet access and the power connectivity is also part of this picture. But that scaling, if we can populate and let thousands of limb fires -- not literal fires, wrong metaphor in this kind of age. But if we can get those people working and knowing how to build more Internet, then we can facilitate even more Internet and more connections happening around there in different ways.

>> Richard: If I could. The reason I struggled with answering that is I think we could do a do a whole hour on how do you innovate at scale with government and people working together. But when I was at Lockheed my title was director of emerging and disruptive technology. And so I was tasked with having to do innovation at this hundred-year-old company, right? And I realized there's a lot of challenges. I'll just hit on three points. There's more than that, but the first is any time you're trying to do a disruptive innovation especially, first you've got to figure out what you're measuring, right? So you get what you measure. And that's why, you know, I mentioned Dr. Richard Carson at UCAL San Diego previously because any time like when we look at what's the effect of this oil spill by BP in the gulf or climate change or whatever, he's really good at trying to make concrete the cost, the actual costs, which isn't in the gallon of gas or isn't in the economy. It's not built in there yet because it's so far down the road. We haven't seen the effects yet. So measuring it appropriately.

The second is alignment of incentives, right? The reason we have difficulties here in education and in healthcare, et cetera, is because we don't have aligned incentives. So everybody's got to be on page and the incentive alignment has to be towards agreed-upon goals. Like we want to do this. May be initially painful disruptive innovation because it's going to pay off, right? And that's the problem with -- even when I was at Lockheed, we were always look -- money we had to spend had to pay off the next quarter or quarter after that. The idea of put ago CD payment down that's going to pay off five years from now was just Aneathema there. And it is to most people because they're living paycheck to

paycheck, where am I going to see the impact of this. And that's again I'm going to keep harping on if you can help people visualize the output and see like if we do make this investment, the reason you should support build back better or the inflation reduction act or these other acts is that this is what it's going to mean and in your community later on and it's not just visibly can I see new infrastructure; it's also -- and that's why with some folks we start talking about the well-being index, right? What if I could look at a community and see like these groups of people, how many of them are feeling better off? And if I -- I don't know about you guys. I'd like to walk down the street in my community and everybody I meet has a smile on their face because they feel fulfilled, happy with where they're going. And -- is anybody here from Brazil?

So I love Brazilian people and I spent a lot of time in Brazil and places like that, but I also had -- I was chased through the streets of cool pool low and I had my car stolen. There's an inequity there and we all know that's true but I'm starting to see it here also and when we get to the point where you have to -- you start seeing kidnapping insurance and run flat tires on your car and fortified homes, you don't want to -- you don't want that. We want to have healthy communities and envisioning that and investing in that with policy and incentives and money is what we should all be trying to work towards.

>> Moderator: Thank you. I think you mentioned something it just always in the back of my mind when we think about being human centered and people centered and it's the narrative in the storytelling that can come out of these pilots, this project, initiatives, you know, everything you presented, how do we get others to listen and to pay attention and say, hey, this is happening in this other part of the world. How do we learn? How do we kind of lift, shift, adapt and test a model or framework somewhere else and tell a story and tell a narrative and I think data helps with that information, helps with that, but really the power of storytelling is how do we get communities to see themselves represented in that? And how are they becoming champions of getting the message and saying hey I'm in this community. Here is how I collaborate or here's how I was part of that process. I think all of you mentioned Puerto Rico at some point or initiative in Puerto Rico. You know, we have socioeconomic demographic characteristic, geo political uniqueness and as we think of, you know, Puerto Rico, for example, as a territory of the United States, it's part of this infrastructure that provides for a legal, you know, policy framework perhaps that might be argued as easier in some ways in other developing countries. Right now we're working in a project, it's called Puerto Rico first initiative. Actually, you know, somebody mentioned in the previous panel around that the Internet was fueled by friendship and that the Internet was built on trust. Ben serve who's actually one of the cofounders and cochair of the people centered Internet with Maling Fung have kind of created an ecosystem for thinking

about the inception of the Internet in the first place that trust and friendship has to be part of the process and communities feel we talked a lot about trust, right? Communities sometimes feel that the -- being disenfranchised means, equates as lower trust but when you have characteristics when data shows that you have high levels of poverty, very low levels of educational attainment, it's the perfect Petetry -- I for continuing a cycle that will have the underrepresented continue to be underrepresented. When we think about sustainability we don't want sustainability in the fact that under represented or disenfranchised communities are not at the table. How do we better create a system, a model, a framework and have the narrative and the storytelling behind this that we can show what is working elsewhere in the world and that it could be modeled and tested and tested in environments perhaps we haven't considered before. I think we have in the audience a great colleague who's also a cochair of the people centered Internet working in the space and I believe some of the Linton wells has been working on how to better think about economic sustainability in a way where it puts, you know, people and communities first but with technology and we talked about generative AI, you know, with voice AI, we have new ways of like extracting the inputs and insights from communities in a scale that we've never seen before. You don't need, you know, a high level of literacy or be able to read and write to use voice and to share your experience through a phone, right? And we have those technologies now how these technologies have disrupted the space when we think about collecting data and information from communities to gather insights that then inform the problem set and give us a common language. Just last final thoughts, I know we're running out of time here and we probably want to open the space for questions and comments. But with the advent of emerging technologies, how do you see community engagement in a different light? And how do we share, you know, united voice that AI is not bad as many policymakers seem to think, right? And it's disrupting an environment where actually it will give a voice to communities through voice AI and other technologies?

>> Richard: Since you were talking about people centered Internet, I always think about doc Sor areel and David wineberg back in 2000 wrote the manifest stoa. I assume everybody's read that, right? And that was more for the .com side of things. Said markets are conversations and all these great technology that is we're wielding should be used to solve societal problems, to look for better benevolent outcomes and instead we just spent a decade bending all this towards like monetizing human attention with social media. And that was a little disappointing to a lot of us. Because instead of curing cancer and populating Mars and all these other -- dealing with climate change and that sort of thing, we have been just monetizing human attention. And so I think this idea of making sure that we build into this, if we're starting to use machine learning and AI, utility functions for those systems that are people centered that do -- because it is very true and I have been

working with machine learning also for 13 years. We can build -- you can build human values into these systems. The question then of course is whose values are you putting into these systems. You can also have algorithmic checks for truth which we did during COVID. The first thing my team did when COVID started for a group called RTI down in North Carolina, we built what we called the COVID brain and the COVID brain was just its only job was to pull in all the information on the Internet and check it for truth. Is it coming from known sources? How often is it repeated? Is it repeated by other people who are worthy sources? Is it making outrageous claims? All that sort of thing. So we could -- and that was everything that it was doing. And I think we can solve -- we can meet some of our existential problems more than halfway by having AI with the right utility functions. And I'll just pause there and let other panelists speak.

>> David: Puerto Rico I just want to say a word about that and you also asked another question. I want to respond to that and they match up. You asked is there a mechanism by which successful practice over here can inform successful practice over there. And I love that question because we asked ourselves that question about a year ago and we launched the program that I shared in my opening remarks. It's called the un50 project. N50 stands for the next 50 percent of the world who have yet to participate fully on Internet-based platforms.

150 other organizations also had been asking that same question. And they piled in. In one year we had 150 organizations, small medium and large, sign agreements to join this organization. Again, it's for free, but what we've found now is that there's this huge engine. Many of these organizations have their own program. Some of them are very local to a community. Some are state or province. Some are country. Some are global. Okay. And they found out, all of them, found out that running their own program and achieving ambitious goals alone cannot be done. It can't be done well. It can't be done at speed. It can't be done period. So we have under the program, programs. It's a program of programs. So we can do a multiplier now and we have multiple projects all around the world and we are doing -- when those projects roll out, there are failures and there are successes. And we report that out. Honestly, we have a director of impact in Geneva who holds our hand on every project and we look at the data and then do a white paper, Webinars, readout to all of those partners and anybody else. This is open to anybody -- the ITU. We have joined in a program with the ITU. And these blueprints or recipes, these play books are open source and they are being plugged and played with adaptation in new additional locations, one of which is Puerto Rico and we have a plan in place to roll out a project. We have the community groups locally are lined up, they're waiting and ready to go and it's very exciting.

>> Moderator: Closing thoughts, Dan.

>> : I realize we're between everybody and lunch.

Coming back to your question, how do we share this? This is the key. It's sharing these success stories, helping people know what's going on out there. You know, there's a -- the association for progressive computing or communication APC recently rolled out a repository and I'll put a link in the Zoom chat but it's CN learning.APC.org which is a community networks learning repository where they have been trying to gather these guidelines and best practices and different tools that can help people and share these success stories around the world. You know, at first like what Dave mentioned the N50 project there, you know, we're doing a lot of work with sharing success stories. It's that. It's we have to share that knowledge and let people understand that this can be done, right? I think that's one of the challenges is people aren't aware of this and they think, Ah, how am I going to get -- you know, I need Internet access here. How can I do it in a way that works for the community? Glen had asked a question in the Zoom chat around isn't it really -- if we could connect communities rather than trying to connect the 4 billion-dollar individual people wouldn't that be better? There's tremendous programs going out there with connecting libraries around the world which can then be focal points in the middle of their community to go and help provide resources and also one important part is the value of every time we bring another community network on we're not just helping the people in that community learn about what's happening on the Internet. We're helping the rest of the Internet learn about what's happening in that community. We're finding -- unleashing the creativity of the people who live in those areas, in the regions there. So it's not just that we're bringing Internet access so people can be able to go and use all the resources that everybody else has been created. We're also enabling people to be creators and to bring their information out there. And a critical part on all of us and if you're at ICANN this week, at other things is to share those stories, to share the information on what is happening and how we can work together and work in communities to connect that remaining part of the world that still wants to be connected. It's a critical challenge. We've got the toolkit, the solution, the blueprints, we just need to let the world know.

>> Thank you so much Dan. Thank you to our panelists David, Richard, Dan, appreciate your time. Great conversation.

[APPLAUSE]

>> Modearator: I know we are in the middle of you and food. But do we have time for quick questions? Is there a running mic going around?

>> Dan: I would also mention too Doreen mentioned in her piece at the beginning about the partner two connective issue, I would suggest people pay attention to that as well because it's a great program happening where people are committing to help connect communities around the world.

>> David: We're a partner in that, Dan. Totally agree.

>> Dan: As are we.

>> Moderator: Where do people go to find information?

>> David: IG Web site just in the search box. Partner to connect. Partner with the No. 2 and connect.

>> Moderator: Partner to connect. All right.

>> Thank you very much for the opportunity. My name is Shakara in from Ghana. I'm the vice chair of telecommunications. So it comes to community natures connected unconnected, I'm going to touch a bit on the agency aspect of it where last year with the help of the ISO foundation in collaboration with net hope, I saw Ghana we run disaster preparedness training where we trained about hundred community members including humanitarians, network engineers, and other stakeholders who would be able to set up or deploy community networks in terms of emergencies. So this has been a great initiative that when I shared when disaster happens in Ghana or any part of west Africa, Ghana and other community members will be able to respond to this emergency by deploying telecommunication. But there has been a few challenge which some of them has been discussed here when it comes to funding, comes to resources, human resource and cyber security issues is some of the issues that we faced. ISOC has funded the initial stage of the project but in subsequent funding is -- one thing that, you know, deploying community agent to serve people during emergency is one of the issue that we are facing. And cyber security issues when the disaster happens, how do we really put it? How do we ensure that data is being protected and no one has access to their data, how are they able to transfer money to -- or people transferring money to them securely with that challenges, yeah, so not to talk much, these are some of the issues we have faced in regards to telecommunication all of the UNECC2025 based out of various stakeholders partners like net tool, CICSCO, save the children all these but some of the issues that we face how best can you really how to make this to ensure these communities have access to the Internet when disaster happens? Thank you.

>> Dan: We could have a whole other conversation around that.

[LAUGHTER]

>> David: I think an entire conference at that subject.

>> Hopefully you can join us at lunch so the people can find us there.

>> Dan: Thank you for the work you're doing in Ghana and yeah that could be a whole conversation.

>> Moderator: Just very brief because it seems like there's two more.

>> David: We work with all of the organizations that you mentioned. All the UN agencies, ETC, Cisco, net hope, et cetera on a partnership basis and I just want to say one thing, back to Puerto Rico, the model that we are looking to work with the local community groups in Puerto Rico on is based on some of the difficulty on fund -- the funding piece for disaster, not just disaster response but preparedness. How can you have funding in a business case that will close in a way that local community groups can be prepared?

Response, money flows sometimes depends on a lot of things. You get donor fatigue and so on and so on. How can there be consistent reliable disaster preparedness? There's a model that works. You have a network that's based on supporting routine day to day needs at the local community level that the community has said they want. But there's a protocol in place with all the community groups on that network where they all know how to repurpose the network for disaster response if when the disaster comes. So it's paid for. Not as as disaster preparedness but as routine day-to-day operational access to the Internet and services it provides. I'm talking really fast. It's a big subject but happy to take it up off line.

>> Richard: Since I have to be brief also the thing I would recommend is again when I was at Lockheed we ran this program called drill about every two years, disaster response integrated logistics. Lockheed would be doing it and have a big war game, FEMA and Home Depot and Lowe's and all these organizations and they would all try to work together and would be given a problem like you've got a category five hurricane rolling up the east coast and, you know, how do you solve for it and make sure everybody's served and things like connectivity and energy and medicine and all those things come into play and again with my gaming mind watching this physical exercise we need to move that all to assimilated world and the reason that's valuable is we ended up building something for its -- here in the U.S. called the architecture integration management director. This is the group in the army that tries to figure out can you give this person this radio on the battle field or can you give them this system and it turns out physically can you afford it? Physically can you

give that person that thing? But then there's all these other things. I think it's called department organization training leadership personnel materials and facilities that are all these business rules that apply. If you're going to have a happy sort of resolution to your problem where you can't just like buy equipment and drop it into a place. It's got to be integrated with this systems thinking view and it's not just plain systems engineering; it's system of systems engineering that's why I would recommend again a simulation to have it the ready so you can explain to people we're going to take your money apply it here and here's the areas that -- where we're going to solve the problem.

>> Dan: And I would just add if you want to e-mail me I'd be glad to reach out to you and we could chat a bit more too.

>> Moderator: Excellent. I think this is being live streamed on Facebook, Twitter, YouTube, notes from the entire conference are going to be shared out as well. The information for every panelist is on the Web site on the program. So thank you again, David Richard, Dan for joining us. A great conversation. I know there's outstanding questions in the audience but we can address them during lunch hopefully and look forward to talking with you all morn. Thank you again.

[APPLAUSE]